Family ASTRO

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Program of Distinction Category:

Leadership, Citizenship, and Life Skills Categories

- Caring Relationships, Community Spirit

Science, Engineering, and Technology Literacy Categories

- Science Engineering & Technology

Youth in Governance Categories

- Community Engagement

Organizational Strategies Categories

- Volunteer Development

Sources of funding that support this program: Family ASTRO is a program sponsored by the Somerset County 4-H Youth Development Program and Raritan Valley Community College (RVCC) Planetarium. Funding was initially obtained through a National Science Foundation and the Astronomical Society of the Pacific (ASP) grant.

Knowledge and Research Base

Science literacy has been a focus of New Jersey 4-H and has recently been recognized as a federal initiative as part of the Science, Engineering and Technology focus. New Jersey schools are mandated to provide a "thorough and efficient" education, including science education. High educational science standards are best achieved when non-formal education organizations work together with formal education partners. This is evident in NASA's strategic plan of "partnering with the educational community … to increase learning opportunities" as well as the Astronomical Society of the Pacific's goal of "serving as a bridge between astronomers and the public." Providing experiential science programs to youth, their parents, volunteers, and educators are essential. Since learning is best achieved when schools, community and family partner together, the Astronomical Society of the Pacific (ASP), in San Francisco, CA, received National Science Foundation funding to develop an experimental project called Family ASTRO- an offshoot of their successful classroom project, Project ASTRO. The primary goals were to develop new hands-on activities and inquiry-based teaching resources in astronomy for families. The Institute for Learning Innovation was contracted to evaluate the Family ASTRO project. The primary goal of Family ASTRO is to encourage families to do activities together. Since the New Jersey site already had a successful Project ASTRO program, and 4-H has strong ties to families and the

community, New Jersey was encouraged to participate in the piloting of Family ASTRO.

Needs Assessment

Family ASTRO is based on a successful Astronomical Society of the Pacific (ASP) project, Project ASTRO, which partners astronomers with teachers and non-formal educators to bring hands on science into the classroom or club setting. Both Project ASTRO and Family ASTRO are National Science Foundation (NSF) funded projects. Through Project ASTRO, they saw that a lot of families were getting involved in the program and wanted to be more involved. The ASP talked with Project ASTRO teachers and astronomers and a large number expressed a desire to do more with families. They addressed this issue with the National Science Foundation and indicated that there was a special interest in encouraging more science outreach to families because research showed that kids whose families were involved with educational programs were more likely to do better in school. The NSF program directors encouraged the ASP to look at past programs carefully and use the strengths of Project ASTRO to make Family ASTRO a success.

Family ASTRO, a spin-off of the program, brings astronomy kits to families. Although The Astronomical Society of the Pacific did not do a formal need assessment before Family ASTRO program, Family ASTRO was pilot tested in the San Francisco Bay Area, New Jersey, and Arizona before becoming a public program. Findings indicated that Family ASTRO has been an extremely successful experiment in creating high quality astronomy materials for families.

Goals and Objectives

These programs assist in accomplishing the following goals:

- Share a love for science with students at an age when they are looking for direction
- Focus on hands-on activities where students can play the role of scientist
- Involve families and community organizations in the learning process
- Make a special effort to reach out to under-served groups

Target Audience

The goal of Family ASTRO is to train educators, astronomers, youth group leaders, and anyone else who is interested, to help children and adults explore astronomy together. Participants learn to lead family astronomy events about the night sky and the solar system using kits that have been developed by the Astronomical Society of the Pacific (ASP).

Program Design and Content

Type of Program

Family ASTRO is a family program that promotes the exploration of astronomy.

Methods used to deliver the program

After completing the leader training, Family ASTRO Event Leaders lead a series of two or more family astronomy sessions with at least 5 to10 families attending each session. The Family ASTRO Events are designed so that families can attend either all sessions, or just one. Each Family ASTRO Event lasts

approximately two hours and involves families doing hands-on activities. The Family ASTRO kits are organized around a topical theme and contain activities to do at the workshop, and also some activities to do at home.

The Astronomical Society of the Pacific (ASP) developed the kits, with support from the National Science Foundation. The four kits available at this time are *Night Sky, Mission to the Moon, Cosmic Decoder, and Race to the Planets*. These kits have been successfully utilized with several community groups, schools, and museums in New Jersey, the San Francisco Bay Area, Boston, Chicago, Michigan, New Mexico, Arizona, Hawaii, and Nevada. The strongest element of Family ASTRO has been its kits, the heart of the program. The National Team has created a successful model for developing high quality science activities for families. Site Leaders, Event Leaders, and families have been overwhelmingly positive about their experiences. Each kit comes in two models: one for the trainers and leaders, with much more extensive instructions, background material, extension activities, and resources, the other for the families themselves, which is easy to use and relatively inexpensive. The family kits include engaging activities that families actually enjoy doing together. Family ASTRO sites provide materials and training to volunteers who host family astronomy events throughout their area. Each regional site is connected with an existing Project ASTRO site, hosted by a lead institution, and supported by a local coalition. In New Jersey, the Somerset County 4-H Youth Development Program and Raritan Valley Community College are the lead institutions that sponsor Family ASTRO.

Curricula and/or educational materials

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Partnerships or collaborations

This program is co-sponsored by the Raritan Valley Community College Planetarium, Somerset County 4-H, and Astronomical Society of the Pacific. We have also strengthened relationships through local networking with: museums and planetariums, schools and school districts, other educational programs, amateur astronomy clubs, and professional astronomers

Program Evaluation

Process

Since 2001, 65 astronomers, teachers, youth leaders, and museum educators have been trained to conduct family astronomy programs in New Jersey.

To date, 1000 families throughout the state have participated in astronomy events. Telephone interviews were conducted with family participants to determine long-term impact. Both the adults and the children at the events have been highly enthusiastic.

Outcomes and Impacts

Adults on average rated the event they attended a 5.48 out of 6. Children rated the event 5.55 out of 6. When asked to rate their likelihood of attending another event on a six-point scale, with 6 being definitely would attend; adults rated their interest in returning at 5.35. Children rated their interest at 5.56.

Of the questions asked to adults:

- 95% of adults will definitely or most likely tell someone else what they learned.
- 93% of adults will definitely or most likely want to learn more about this subject.
- 95% of adults will definitely or most likely try something new or different as a result of the workshop.

Of the questions asked to the youth:

- 89% of the youth will definitely or most likely tell someone else what they learned.
- 98% of the youth will definitely or most likely want to learn more about this subject.
- 98% of the youth will definitely or most likely try something new or different as a result of the workshop

An overwhelming majority of both adults and children indicated that this event had an impact on them, with nearly 90% responding positively to every question.

Throughout the participating states:

- There has been a significant increase in the diversity of the program audience, thus a Spanish-language kit was created to increase the participation of the Latino community.
- More than half (59%) of families who participated in the evaluation had children who attended schools with free lunch programs, i.e., public schools with economically disadvantaged children. Additionally, more than a quarter (28%) of the participating families was eligible for free lunch. The children who participated in events were almost evenly split among girls (46%) and boys (54%).
- According to family feedback, Family ASTRO has not just been a good experience for learning content. It has also been a positive family learning experience. When asked if they would change anything about the event they attended, 41% of adults and 49% of children could think of nothing to change. In the months following their attendance at a family event, almost three quarters (74%) of the parents reported that someone in the family had done a Family ASTRO take-home activity since the event. Of those families, 81% reported that this activity had been done by parents and children working together. In addition, 92% of families reported doing

at least one astronomy-related activity (other than the take-home activity provided by Family ASTRO) since the event.

Communication to stakeholders

This program has been presented at NAE4-HA conferences, National and local Science Teacher Conferences, and published in Science teacher journals.

Program Sustainability

Family ASTRO is a program sponsored by the Somerset County 4-H Youth Development Program and Raritan Valley Community College (RVCC). Funding was initially obtained through National Science Foundation and the Astronomical Society of the Pacific (ASP). Educators from the RVCC planetarium help teach leader trainings and family events. Event leader trainings are $150 for a full day workshop. This fee covers all materials and leader kits plus a family kit per event leader. Extra family kits are available for $20/kit (and can be ordered at any time). Leader workshops are held bi-annually and on average 15-20 people per year are trained as Family ASTRO event leaders.

Replication

To learn how to replicate this program in your state visit: http://www.raritanval.edu/planetarium/familyastro/ to learn more about the New Jersey site.

If you are interested in becoming involved in Family ASTRO, contact the site nearest you. For updates to this list, check the web site at: http://www.astrosociety.org/.

Rationale and Importance of Program

Participating with the project has allowed Somerset County 4-H and the New Jersey 4-H program as a whole to expand space science programming to more families. By collaborating with the new astronomy partners from the project, we were able to start offering new programs and start new clubs. Astronomers from the project became teaching volunteers for 4-H Star Parties, 4-H Science Days, Rutgers Cooperative Extension Day Camps, and other special interest programs. This family program enables us to continue our mission by:

- Sharing a love for science with youth and their families
- Utilizing astronomers and educators as volunteers for 4-H
- Training the volunteers in age-appropriate ways to present astronomy
- Focusing on hands-on activities where youth can work with their parents or grandparents to play the role of scientist
- Involving families and community organizations in the learning process
- Making a special effort to reach out to under-served groups
- Connecting with other participants on a local and a national level